

Notice of Allowability

Application No.

10/658,495

Examiner

Thomas H. Parsons

Applicant(s)

CHANG ET AL.

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1745

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to the Amendment filed 18 May 2006.
2. ☒ The allowed claim(s) is/are 1-9 and 11-23.
3. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) ☐ All b) ☐ Some* c) ☐ None of the:
 1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
 5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
 - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
 - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
 - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☒ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3. ☐ Information Disclosure Statements (PTO-1449 or PTO/SB/08), Paper No./Mail Date _____
4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
5. ☐ Notice of Informal Patent Application (PTO-152)
6. ☒ Interview Summary (PTO-413), Paper No./Mail Date _____
7. ☒ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other _____

Response to Amendment

This is in response to the Amendment filed 18 May 2006.

(Previous) DETAILED ACTION

Drawings

1. The objection to Figure 6c because of a minor informality has been **withdrawn** in view of Applicants' Amendment.

Specification

2. The objections to the disclosure because of minor informalities have been **withdrawn** in view of Applicants' Amendment.

Claim Rejections - 35 USC § 102

3. The rejections of claims 1-5, 10-15, 19, 21 and 22 under 35 U.S.C. 102(b) as being anticipated by Uchida et al. (6,057,051) have been **withdrawn** in view of Applicants' Amendment.

Claim Rejections - 35 USC § 103

4. The rejections of claims 6-9 under 35 U.S.C. 103(a) as being unpatentable over Uchida et al. as applied to claim 1 and 2 above, and further in view of Gamo et al. (5,976,725) have been **withdrawn** in view of Applicants' Amendment.

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5. The rejections of claims 16-18 under 35 U.S.C. 103(a) as being unpatentable over Uchida et al. as applied to claims 1 and 3 above have been **withdrawn** in view of Applicants' Amendment.

6. The rejections of Claims 20 and 23 under 35 U.S.C. 103(a) as being unpatentable over Uchida et al. as applied to claims 1, 6 and 8 above, and further in view of Streckert et al. (6,447,945) have been **withdrawn** in view of Applicants' Amendment.

EXAMINER'S AMENDMENT

7. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it **MUST** be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with Kenneth Lao on 23 June 2006.

The application has been amended as follows:

Claims 24-45 have been canceled, and the Applicants may refile these in a divisional application.

Page 5, between lines 27 and 28, the following text has been inserted: --Figure 6c is a schematic representation showing a pump in combination with a fan being used to direct hot air from the interior of a portable PC to the cathode side of a fuel cell.--; and,

Page 8, line 12, after "fuel cell 120", the following text has been inserted: --, as shown in Figure 6c.--.

Reasons for Allowance

8. The following is an examiner's statement of reasons for allowance:

Applicant's arguments, see page 12, line 4 through page 13, line 2, filed 18 May 2006, with respect to claims 1-9 and 11-23 have been fully considered and are persuasive. The rejections of the claims have been **withdrawn**.

As set forth therein, the Examiner also states that Uchida discloses a fuel conduit operatively connecting the replenishing unit and the cell compartment and part of the fuel component is heated through the fuel conduit as the fuel component is conveyed to the cell compartment in the fuel cell (item 6b in Figures 7 and 10; col.6, lines 13-23 and 49-59).

The Applicants argue that it is respectfully submitted that Uchida discloses a hydrogen fuel cell wherein a hydrogen storage unit is used to provide hydrogen gas to the fuel cell body and an air feed device is used to supply oxygen to the fuel cell body for the generation of electricity (see Abstract). A plurality of hydrogen supply pipes 6b are used to feed the hydrogen from the hydrogen storage unit 5 to the fuel cell body 4 (col.6, lines 13 - 23). The hydrogen supply pipes 6b are embedded in the water retention means 8 (col.6, lines 29-30). The hydrogen supply pipes 6b are made of a material which allows water, but not gas, to permeate through. As such, water in the water retention means 8 can penetrate into the hydrogen supply pipes 6b to humidify the hydrogen gas fed to fuel cell body (col.6, lines 44 - 49). Although the water retention means 8 is used to absorb heat and used as a heat exchanger, it is used to absorb heat produced by the fuel cell body when the fuel cell generates electricity (col.6, lines 49-58). The

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heat is used to heat the hydrogen storing alloy in order to enhance the efficiency of discharging the stored hydrogen gas from the hydrogen storing alloy.

The claimed invention uses a fuel activation unit in a fuel cell to activate a liquid fuel component in order to generate electricity. The liquid fuel component is stored in a fuel replenishing unit. A fuel conduit connected between the fuel replenishing unit and the fuel cell is used to replenish the liquid fuel component in the fuel cell. Heat generated in the PC is used to heat the liquid fuel component while it is passing through the fuel conduit so that the heated liquid fuel component can be more efficiently activated in the fuel cell.

Uchida only discloses heating the fuel replenishing unit (the hydrogen storing alloy) to enhance of efficiency of discharging the hydrogen gas stored in the hydrogen storing alloy. Uchida does not disclose heating the fuel component in the connecting conduit and causing the heated fuel component to engage in the fuel activation unit for activation so as to enhance efficiency of the activation in the fuel activation unit. In fact, Uchida uses a water retention unit 8 to channel away the heat produced by the fuel cell body (col.6, lines 49-58).

Guan et al. (6,916,568) disclose a fuel cell module with heat exchange and electricity exchange functions, consisting of one heat dissipation module and one electricity exchange module. The heat dissipation module is composed of several hydrogen cans and one heat dissipation base contacted with the CPU and the electricity exchange module contains a hydrogen release pressure platen, a flow rate control valve and the Proton Exchange Membrane Systems. The flow rate control valve controls the hydrogen released from the hydrogen cans that absorbs the heat generated by the CPU rapidly for heat exchange. The released hydrogen is transmitted to the Proton Exchange Membrane Systems that converts chemical energy into

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electric energy and is then utilized by the computer. Such heat exchange of the CPU provides the computer with D.C. power, clears up the heat dissipation problem, and substitutes the portable power for current notebooks (abstract).

The hydrogen storage cans 12 are furnished with solid hydrogen storage alloy inside with a contact valve 122 on the inserting mouth in front of the hydrogen storage can 12 as the outlet for replenishing and releasing hydrogen. By touching the contact valve 122, the stored hydrogen is released as gas, making the hydrogen storage can 12 absorb the heat while releasing the hydrogen and rapidly reducing the temperature of the external can (col. 2: 66-col. 3: 10). "...the several hydrogen storage cans 12 in the heat dissipation base 11 provide rapid heat exchange function by absorbing the heat generated by the CPU, reducing the temperature of the whole heat dissipation base 11 immediately ..." (col. 3: 11-24). "...the large-sized Proton Exchange Membrane Systems 23 is able to exchange the oxygen from the atmosphere under normal pressure, thus enhances the efficiency of converting chemical energy to electricity energy of the fuel cell..." (col. 4: 1-8). "...The direct and rapid heat absorption of the hydrogen storage cans 12 enhances the heat exchange efficiency of the CPU 4 and improves the heat dissipation of the high-level CPU used in current computers. The hydrogen release platen 21 and the flow rate control valve 22 of the electricity exchange module 2 controls the hydrogen released from the hydrogen storage cans 12 which is then transmitted to the Proton Exchange Membrane Systems 23 for the conversion from chemical energy to electricity energy and then output to the motherboard 3 of the computer as its D.C. power. The replaceable hydrogen storage cans 12 allow people to replenish the hydrogen when running out of hydrogen..." (col. 4: 10-34).

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Guan only discloses heating the fuel replenishing unit (the hydrogen storing alloy) such that the stored hydrogen is released as gas for the alloy and making the hydrogen storage can absorb the heat while releasing hydrogen and reducing the temperature of the external can thereby enhancing the heat exchange efficiency and heat dissipation of the CPU.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Thomas H. Parsons whose telephone number is (571) 272-1290. The examiner can normally be reached on M-F (7:00-4:30) First Friday Off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Pat Ryan can be reached on (571) 272-1292. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would

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like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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